

## THE FAUNA AND FLORA OF THE EL SEGUNDO SAND DUNES (Continued)

### 7. TWO NEW PHALONIID MOTHS

By JOHN A. COMSTOCK

Late in 1937 we submitted specimens of a Phaloniid moth to August Busck for determination, and were advised by him that it was a new species. He suggested that we endeavor to study the life history and publish notes thereon, together with a description of the imago.

At that time we were unable to find the larva in spite of the very helpful suggestion given in a letter from Mr. Busck in which he wrote: "The larva will be found to be a stem borer in one or more of your native weeds, probably of the family Compositae."

As a result of the ecological studies carried on in the sand dunes of El Segundo, California, by Dr. W. Dwight Pierce and his co-workers, a boring larva feeding in the stems of *Encelia californica* Nutt., was brought into our laboratory, and the resulting moths proved to be of this new species.

In recognition of Mr. Busck's helpfulness and generosity in this, as in all other matters wherein we have sought his aid, I propose for this species the name

#### ***Carolella busckana* n. sp.**

Holotype male. Alar expanse, 21 mm. Plate 22, fig. A.

Labial palpi, white above, with a few blackish brown scales at the sides; heavily mottled brown ventrally. Head and thorax evenly speckled with white and blackish brown spots.

Forewings above covered with an admixture of white and brown scales, giving all areas of the wing a peppered appearance, in addition to which a number of blackish scales occur as spots over certain areas.

A quadrate dark brown large spot runs obliquely across the center of the wing much as in *C. mexicana* Busck. This spot is heavily checkered with black scales. Laterally and also medially to it is an area in which the white scales predominate.

The outer third of the costal margin bears four large blackish bars, separated by white areas. The outer third of the wing is divided into a lateral predominantly whitish area, finely speckled with light brown scales, and an inner deep brown irregularly triangulate area, crossed by wavy broken black lines.

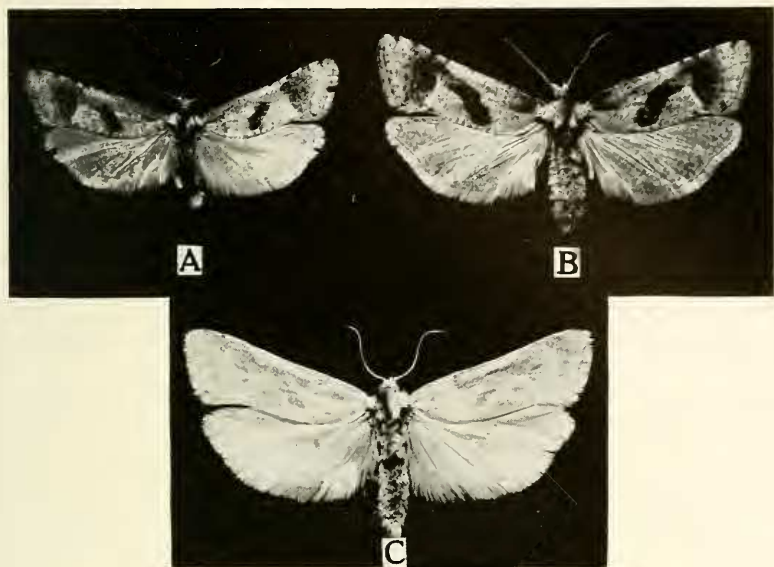


PLATE 22

Fig. A Holotype ♂, *Carolella busckana* Comst. Superior aspect, enlarged x 2.

Fig. B. Allotype ♀, *C. busckana* Comst. Superior aspect, enlarged x 2.

Fig. C. Allotype ♀, *C. busckana willettana* Comst. Superior aspect, enlarged x 2.

Photo by Cobb.

Fringes, speckled black and white, the margins nearly black.

Secondaries, superior surface, uniformly mottled or pebbled light brown and white, the brown irrorations suggesting the pattern of a netting. Fringes predominantly white.

Inferior surface; primaries. The black bars with white interspaces on the outer third of costal margin are the only markings which carry through from the upper surface. The remainder of the wing is a suffused smoky slate-black. The secondaries are similar in appearance to the upper surface, although there is a slightly heavier mottling of brown scales.

Abdomen, transversely barred with black and white scales. Under surface of thorax and legs, speckled black and white.

Allotype female. Expanse, 25 mm. Plate 22, fig. B.

The markings are in every respect similar to those of the male. Except for the larger expanse and stouter abdomen it is practically impossible to distinguish the sexes without resorting to a dissection.

This species is close to *C. mexicana* Busck, but differs in having costal, apical and dorsal blackish brown dots, in the long

curved lobes of the female ovipositor (as compared to short straight lobes in *mexicana*), in the relatively larger size and in the greater preponderance of slaty gray scales in the maculation. The male genitalia are shown on Plate 23.



PLATE 23

Genitalia of ♂ *Carotella busckana* Comst., highly magnified.  
From preparation by August Busck.

Photo by Cobb.

There is great disparity in the size of individuals in this species. The smallest in our series has an alar expanse of 15 mm., and the largest measures 28 mm.

Described from a series of 35 examples, as follows:

Holotype male. El Segundo, California, November 16, 1938 (emerged). Coll. W. D. Pierce.

Allotype female. El Segundo, California, November 29, 1938 (emerged). Coll. W. D. Pierce.

Paratype No. 1. Male. Beverly Terrace, California, December 12 - January 5, 1929; genitalic slide A. B.

Paratype No. 2. Female. Same data as No. 1.

Paratypes Nos. 3 and 4. Loma Linda, San Bernardino County, California. No dates.

Paratype No. 5. West Riverside, California, February 10, 1906.

Paratype No. 6. San Diego, California, November 13, 1920. Coll. K. R. Coolidge

Paratype No. 7. San Diego, California, February 26, 1922. Coll. E. Piazza.

All of the above placed with the United States National Museum.

Paratypes Nos. 8-10. San Diego, California, February 26, 1922. Coll. E. Piazza.

Paratypes Nos. 11-12. San Diego, California, December, 1924.  
Paratype No. 13. Beverly Terrace, California, December  
12 - January 5, 1929.  
Paratype No. 14. Los Angeles, California, July 4, 1929.  
Paratypes Nos. 15 to 33. El Segundo, California (emerged).  
Dates run from November, 1938 to January, 1939. Coll.  
W. Dwight Pierce.

Paratypes will be placed with the Canadian National Museum at Ottawa, through Dr. J. McDunnough; with the Philadelphia Academy of Natural Sciences, the California Academy of Sciences at San Francisco, the San Diego Museum of Natural History, and the British Museum. The remaining paratypes will be retained in the collection of the Los Angeles Museum.

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A small series of another *Carolella* was collected by Mr. George Willett at Chuckawalla Springs, Riverside County, California, which seems to be very distinct in spite of the fact that the male genitalia are indistinguishable from *busckana*. In our rather long series of *Carolella* we find no examples that intergrade between this and the species above described. Mr. Busck considers that the Chuckawalla Springs form is hardly deserving of a name because of the genitalic similarity, yet in spite of the weight of his authority we venture to describe it as a desert race or form of *busckana* on the strength of the very different maculation.

*Carolella busckana willettana* f. nov.

Holotype male. Expanse 27 mm.

Superior surface, primaries; immaculate cream-white, except for two areas. The diagonal quadrate bar crossing the middle of the wing is a light yellow-brown, and is not regularly quadrate as in *busckana*, the margins being distinctly sinuate. A similar color suffuses the inner half of the outer third of wing. A few light brown scales are scattered irregularly throughout the white scales. There is however no conspicuous spotting of black as is the case with *busckana*. The outer margin of the wing is narrowly edged with light brown.

Fringes, white. In a few of the paratypes there is a slightly checkered appearance to these fringes.

Secondaries, immaculate pearly white, with white fringes.

Inferior surface, primaries; gray white, shading to pure white at the outer margin. Fringes, white. Secondaries, immaculate pearly white throughout. A few of the paratypes show a slight admixture of light brown scales, but there is no suggestion of the reticulated pattern characteristic of *busckana*.

Antennae, white above, brown below. Labial palpi, white on the dorsal surface, brownish white below. Head, white. Thorax,

predominantly white, with a few brown scales. Abdomen and legs white.

Allotype female. Expanse 27 mm. Plate 22, fig. C.

All color and markings practically indistinguishable from male.

Described from a series of thirteen specimens, as follows:

Holotype, Chuckawalla Springs, Riverside County, California, December 25, 1937. Coll. G. Willett. Deposited in the U. S. National Museum collection.

Allotype, same data. In the collection of the Los Angeles Museum.

Paratypes Nos. 1 to 7. All taken at the same place and date by Mr. Willett.

Paratypes 8 to 11. San Felipe Wash, San Diego County, California, in February and March of 1937, coll. J. A. Comstock. (Paratype 10 at Mason Valley not far from San Felipe Wash.)

Paratypes will be placed in the Canadian National Collection and in the collection of the San Diego Museum.

*Carolella busckana* is a gall former in the stems of *Encelia californica* Nutt. The galls begin to form in young green shoots in the spring and reach their maturity in September and October. The average gall measures about 35 mm. long by 12 mm. wide. At the time of maturity the plant appears to be dead, all of the leaves having withered. The stems containing the galls, however, are all living, and young buds are beginning to form on their surfaces. The presence of the gall does not kill the plant, and many vigorous branches may arise from it the following spring.

The young larvae (up to at least 3.5 mm.) are translucent yellow-white, with black heart-shaped heads. In the later instars (the exact number undetermined) the head is light yellow-brown, considerably flattened, the mouth parts being a darker brown, and the ocelli black. The head is much smaller than the first segment.

The mature larva measures approximately 12 mm. It is grub-like in appearance, widest at about the sixth segment, and tapers markedly towards the head and tail. The segments are stout and rounded. The ground color of the body is a soiled ivory or yellowish white. A suggestion of a gray mid-dorsal line is present in the majority of examples. Otherwise there are no spots or distinguishing marks.

Legs, concolorous with body, the terminal segments slightly more yellow; prolegs (four pair in addition to anal prolegs) relatively very small, concolorous with body; crochets in a circle,

light brown, and very minute. Spiracles, very small, circular, brownish black rimmed, with yellowish white centers.

When the larva prepares for pupation it first weaves a fine silken diaphragm at the uppermost part of the gall cavity, thus closing off the excavated area which extends upward a short distance into the stem. Occasionally there are two of these diaphragms, close together. A side channel is then cut at some point in the wall of the upper fourth of the gall chamber. This channel is cut nearly to the outer surface of the bark. The larva then weaves a tubular silk channel from this point downwards to about the central portion of the gall chamber, where the channel is expanded to form a cocoon. The lower third of the gall chamber is filled with excreta. Occasionally the point of exit is made in the lower fourth of the chamber wall. In that case the silken channel runs upward to communicate with the cocoon, and the upper third of the gall chamber is packed with excreta.

The mature larva, in dorsal view, is shown on Plate 24.

Pupa, average length 8.5 mm, sub-fusiform.

Ground color, ivory-white with a tinge of yellow-orange over the thorax and abdomen, the segmental junctures darker. Vertex, dark brown, and protruded forward at the tip to form a keel-like sharp process. Eyes nearly black. The tips of the wing cases reach about three-fourths the distance toward the cauda.

On each typical abdominal segment there are two transverse lines of sharp processes, the first beginning above the spiracle, extending along the anterior margin of the segment close to the segmental juncture, and from thence down to the spiracle of



PLATE 24

Mature larva of *Carotella busckana* Comst.,  
dorsal aspect, enlarged approx. x 5.

Photo by Cobb.



the opposite side. The points of each process incline caudally and are black.

The second line of processes, paralleling the first, runs over the segment at the juncture of the anterior two-thirds with the posterior third. The points in this line are not as long as those of the first. These two lines or rows of spines are undoubtedly developed for the purpose of aiding the chrysalis to propel itself forward in its silken tube to the point of emergence. The sharp keel-like process on the vertex aids in splitting the outer bark of the plant at the point of exit.

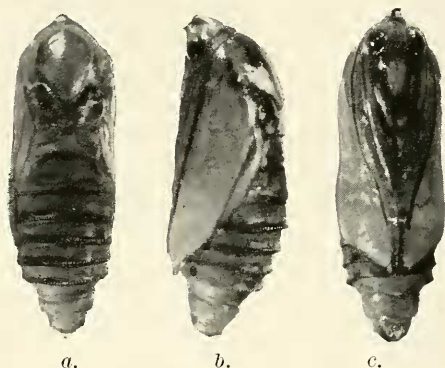


PLATE 25

Pupa of *Carolella busckana* Comst. shown in (a) dorsal, (b) lateral, and (c) ventral aspects. Enlarged x 5.

Photo by Cobb.

The cremasteric end is well rounded and bears a few fine recurved yellow-brown hooklets. There are also a few short stubby pointed processes on the dorsal aspect of the last two caudal segments.

Plate 25 illustrates the pupa. The example pictured has a slightly shorter abdomen than occurs in typical specimens. The cremasteric hooklets are too small to be shown in the cut.

When emergence occurs the pupa works its way out through the opening but remains at the entrance, as shown in Plate 26.

The moths emerge from about October or November through to February. At that time the foodplant is woody and appears lifeless, and it would be impossible for the young larvae to burrow into this hard structure. It is presumed therefore that the eggs do not hatch until succulent young growth has made its appearance.

The range of the species is at present unknown, but examples in the Los Angeles Museum collection record it over a territory extending from San Diego north to El Segundo.

The writer examined *Encelia* along the coast highway north of Santa Barbara and found no evidence of galls.



PLATE 26

Upper half of gall on stem of *Encelia* showing cast skin of pupa of *Carolella busckana*, enlarged approx.  $2\frac{1}{2}$ .

Photo by Cobb.

## 8. NOTES ON THE LARVA OF LORITA ABORNANA BUSCK. (LEPIDOPT.)

The mature larva of this species is very elongate and narrow with the body somewhat flattened. Average length, 7 mm.

Head, light orange. Maxilla, white. Mouth parts, dark orange. Ocelli, black.

The first segment is orange, with longitudinal bands of a darker orange.

Body, dorsal area, light tan, with a narrow mid-dorsal stripe, slightly darker. A lateral supra-stigmatal brown longitudinal band is present, and below this the body is a light tan.

Abdomen, yellow-tan.

The entire surface of the body, except the first segment, is covered with minute whitish specks.

Prolegs concolorous with abdomen; legs slightly darker.

The body is clothed with moderately long colorless setae.

Food plant, Dodder, *Cuscuta californica* Choisy. Collected in the sand dune area of El Segundo, California.